Next Generation 9-1-1 and the Commonwealth of Virginia

Introduction

In the Commonwealth of Virginia emergency calling has evolved beyond the traditional 9-1-1 call. Text messaging and instant messaging are becoming a more common method of communicating than traditional two-way voice communication. Pictures and videos are increasingly shared through the use of smart phones. Video and text based communications are now the communications norm for the deaf and hard of hearing.

Increasingly, automobiles are outfitted with telematics systems that provide third-party call centers with valuable crash data when a car is involved in an accident. These technologies are a reality in Virginia today and our citizens expect to be able to place a 9-1-1 call and receive help with the technologies that they currently use.

Yet, with all of these advancements in consumer communications technology, Virginia's legacy 9-1-1 system cannot deliver any of this information to 9-1-1 centers, also known as Public Safety Answering Point (PSAPs). The architecture of the legacy 9-1-1 system is based on circuit switched telephony designed to enable telephone calls to 9-1-1, not data. In order to support the current and future needs of Virginia citizens, we must expand the planning effort for an Internet Protocol (IP)-based communications system referred to as Next Generation 9-1-1 (NG9-1-1)[1] to enable PSAPs to receive this valuable data.

Currently, this planning initiative is being led by the 9-1-1 Services Board and the Virginia Information Technologies Agency's (VITA's) Public Safety Communications (PSC) Division and is described in the Virginia Statewide Comprehensive 9-1-1 Plan[2].

Case for Effectiveness and Efficiency

In terms of providing greater levels of effectiveness, there are several reasons why a NG9-1-1 system would constitute a dramatic improvement over the traditional 9-1-1 environment.

- NG9-1-1 would enable 9-1-1 calls to be received from virtually any end user device served by any type of IP-based call delivery network using any available mode of communication, including voice, text, data, image and video.
- NG9-1-1 would enable 9-1-1 calls and the critical information associated with these calls to be seamlessly transferred from one PSAP to any other PSAP connected to the statewide network.

[1] NG9-1-1 is an IP-based system comprised of managed IP-based networks (ESInets), functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provide additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected communications sources, and provide multimedia data capabilities for PSAPs and other emergency service organizations

[2]The Plan and its supporting strategic initiatives are available via the following link: http://www.vita.virginia.gov/isp/default.aspx?id=14860.

- NG9-1-1 requires the use of flexible, open and non-proprietary standards, which would facilitate information exchange between and among different emergency responder groups, thus enabling interoperability.
- NG9-1-1 would enable PSAPs to benefit from the technological advances that are already transforming the telecommunications sector. This would reduce the threat of "vendor lock-in" and PSAPs would be able to benefit from declining costs.

Moreover, efficiency gains would also arise from the implementation of a NG9-1-1 system. NG9-1-1 would facilitate cooperative arrangements between and among PSAPs connected to the statewide network; enable the automatic delivery of additional information regarding the caller or the caller's location; and, enable 9-1-1 networks to be managed in a modular fashion, thereby providing more opportunities for competitive supply of the different elements of the system. In principle, the case for migrating to a NG9-1-1 system is undeniable.

Governance

The Commonwealth is recognized as a national leader in the deployment of 9-1-1 technologies. For the past decade, strong statewide coordination and local commitment has made ubiquitous landline and wireless E-911 service a reality.

However, technological changes related to the Internet and broadband networks have created an opportunity for local PSAPs to transition to a more advanced communications platform. State oversight by state agencies will be a critical component to spur the necessary technological development and cooperation that will make the use of advanced communications infrastructure possible. This infrastructure will require investment in an interoperable mission critical Emergency Services IP network (ESInet) and the control to oversee and address network failures.

The reliability and functionality of the 9-1-1 system is not only a matter of the state of the network, but also the equipment. State oversight should ensure adherence to a standardized architecture that facilitates greater functionality as well as enable PSAPs to procure equipment and software at lower costs. The starting point for encouraging PSAPs to upgrade their infrastructure is for state leadership to educate PSAPs about new technological opportunities. Included in this outreach effort should be an acknowledgment of the cultural changes of migrating to a new technological environment.

One of these cultural changes will be the realization and acceptance of the need for PSAP consolidations. The concept of "PSAP consolidation" has historically been viewed as contentious. In general, PSAP resistance to consolidation reflects concerns not only about the possible loss of jobs, but even more fundamentally about the loss of control.

However, a modern IP-based NG9-1-1 system can afford PSAPs with new opportunities grounded in sharing economies of scale and responsibilities. If state leadership highlights the capabilities that collaboration and cooperation can provide, PSAPs can be empowered to action through a collaboration strategy, not consolidation.

The key will be in developing models of cooperation between PSAPs and state government in which collaboration is structured through a well-understood model of governance. After all, "experience in public sector cross-boundary collaboration demonstrates that a sound governance structure is critical to

success and should not be left to chance."[3] The end result of this approach should be the adoption of advanced technology by PSAPs and the use of mission critical applications that can tie together all relevant stakeholders as part of a statewide system architecture.

Funding

In Virginia, the dedicated funding source for 9-1-1 services is end-user surcharges. The services subject to surcharges, the collection method and the amount of the surcharges, and the agency to which these surcharges are remitted are identified in the Commonwealth's Communication Use and Sales Tax Act, http://law.onecle.com/virginia/taxation/ch6.2.html. In most states, 9-1-1 funds are remitted to a government agency after they are collected by a service provider, and the trend has been towards greater involvement of state entities in the remittance stage. Many states, including Virginia, have realized that in order to promote administrative efficiency and fairness, a state-level collection process is necessary.

In the near term, our most urgent challenge will be to evaluate whether or not the existing statewide funding strategies are sufficient to enable the build-out and operation of next generation 9-1-1 services to adequately promote and protect our citizens. A critical predicate of this evaluation is to define "sufficiency." In order for this definition to be relevant, it will need to bridge the gap between current capabilities and future needs, include both recurring and non-recurring costs, match the expectations, demands, and communication usage patterns of Virginia citizens, and identify a desired level of service for a next generation system.

It is important to understand that this NG9-1-1 system represents both a value-added proposition and a cost savings measure. However, efficiencies and costs savings are long-term outcomes. In the short-term, the funding requirements for a move to a NG9-1-1 system will be greater than the current 9-1-1 system costs. These costs will include:

- Capital expenditures involved in building out a new system.
- Transitional costs involved in maintaining the legacy 9-1-1 system while migrating to a new system.
- Network security and encryption requirements costs associated with a public safety grade IP-based system.
- Recurring costs of a NG9-1-1 system.

In addition to these costs, a potentially significant challenge for funding a next generation network is the need for a cash reserve for future capital upgrades. In order to be successful, "[f]unding mechanisms must be crafted that allow 9-1-1 administrators to amass a capital reserve for deployment of a new IP based 9-1-1 infrastructure."[4]

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[3] National Association of State Chief Information Officers, *Getting Started in Cross-Boundary Collaboration: What State CIOs Need to Know*, (2007) (available at http://www.nascio.org/publications/documents/NASCIO-CrossBoundaryCollaboration.pdf).

[4] NENA VoIP Operations Funding Work Group of the VoIP Operations Committee, *VoIP Funding and Regulatory Issues Operational Information Document*, (June 6, 2006) (available at http://www.nena.org/sites/default/files/VoIPNENAFundingRegulatoryOIDfinal060606.pdf.

Technical Framework

To date, three NG9-1-1 demonstration projects are currently underway and supported by VITA's PSC Division, with another project set to begin late in the third quarter of 2011. The active projects are situated in southside, southwest and the New River Valley regions of the Commonwealth. These projects were awarded initial funding through the 9-1-1 Services Board's PSAP Grant Program and supplemental funding through a federal ENHANCE 9-1-1 grant. The focus of these projects is to test the various technical components, and related issues, of a NG9-1-1 network.

- The southside project, which includes the counties of Franklin, Patrick, and Pittsylvania and the city of Danville, is evaluating the delivery of wireline, wireless and VoIP 9-1-1 calls via an IP network maintained by a Competitive Local Exchange Carrier (CLEC) to 9-1-1 centers with IP-enabled telephony equipment.
- The southwest project, which includes the counties of Dickenson, Lee, and Wise and the city of Norton, is focusing on overcoming the issue of limited availability of local IP connectivity and developing a recurring cost model that will be viable in the most economically challenged areas of Virginia.
- And finally, the New River Valley project, which includes the towns of Blacksburg and Christiansburg and Montgomery County, is investigating the deployment of a regional broadband IP network that can support several public safety communication applications through an integrated interoperability governance structure.

The project slated to begin later this year will involve a NG9-1-1 project utilizing an existing robust microwave network in the Tidewater region.

Conclusion

The opportunity to upgrade our existing 9-1-1 communications system is not merely a compelling opportunity, but an imperative. The planning initiative led by the 9-1-1 Services Board and VITA's PSC Division will be completed by the end of calendar year 2011. The outcome of this initiative will be an implementation strategy for NG9-1-1. The citizens of Virginia expect to be able to reach 9-1-1 using an array of modern technologies and given the strength of the case already provided, and the widespread awareness of the need to do so, there is little reason to delay.